DOCUMENT RESUME

ED 134 696 CE 008 846

TITLE	Motorcycle Training for California Driver Licensing Personnel. Final Report.
INSTITUTION	California State Dept. of Motor Vehicles, Sacramento.
SPONS AGENCY	California State Office of Traffic Safety, Sacramento.; National Highway Traffic Safety Administration (DOT), Washington, D. C.
PUB DATE	Dec 74
NOTE	79p.; Project conducted by the Division of Field Office Operation
EDRS PRICE	MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS	*Driver Education; *Examiners; Institutes (Training Programs); Motor Vehicles; Performance Tests; *Program Development; Staff Improvement; State Programs; *Test Construction; *Traffic Safety; Training Objectives; Training Techniques
IDENTIFIERS	California; *Motorcycles

ABSTRACT

The development of a 6-hour motorcycle course of instruction for personnel responsible for motorcycle licensing is described in this project report. The primary goals are stated and include (1) training driver licensing personnel in motorcycle safety and principles of operation, and (2) purchasing and installing appropriate motorcycle skill testing equipment, i.e., traffic cones and paint to adequately lay out the skill course. Part 1 of the report covers project development. Part 2 presents the training course, including work plan, specific task elements, classroom training procedures, and field training procedures (hands-on phase). Part 3 reports on the development of motorcycle skill and road test system. Pre- and posttest results and participant evaluation of the training course are included. Project costs are also briefly discussed. Appendix A contains the course outline. Specifications for setting up the motorcycle skill course and for administering the skill test are included in appendix B. Appendix C presents the breakdown of the statewide training schedule and map of training locations. Appendix D contains the breakdown of motorcycle skill tests administered by each office statewide. Appendix E presents distribution of responses for pre- and posttests, and for evaluations. (TA)

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STATE OF CALIFORNIA DEPARTMENT OF MOTOR VEHICLES
DIVISION OF FIELD OFFICE OPERATION

CE

ROBERT C. COZENS
Director

MOTORCYCLE TRAINING FOR CALIFORNIA DRIVER LICENSING PERSONNEL

Final Report
Traffic Safety Project Agreement
057405

December 1974

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FOREWORD

Motorcycle safety has in recent years, and continues to be, one area of vital concern in California's total traffic safety program. With the current rise in popularity of the motorcycle, as an important vehicle for recreation in general, and transportation in particular, the California Department of Motor Vehicles has an ever-increasing responsibility to maintain quality testing in the area of licensing motorcyclists. Therefore, to ensure that its traffic safety-related responsibilities would be maintained, the Department of Motor Vehicles provided all drivers license examining personnel with a course in motorcycle safety and principles of operation; thus enabling the examining personnel to more confidently and effectively evaluate motorcyclists' skills.

Major support for the motorcycle training project was given by the National Traffic Safety Administration through Agreement No. 057405 with the Office of Traffic Safety, State of California.

The project was conducted by the Division of Field Office Operation under the direction of H. L. Hammonds, Chief. Project supervision was provided by David Hammero, Project Leader. The principle task of motorcycle instruction was accomplished through a consultant services contract with Long Beach Safety Council Inc., Long Beach, California under the direction of Charles W. Smith, Managing Director.

The opinions, findings and conclusions expressed in this report are those of the California Department of Motor Vehicles and not necessarily those of the Office of Traffic Safety, State of California or the National Highway Traffic Safety Administration.

ACKNOWLEDGMENT

Acknowledgment and appreciation are extended to the many Department of Motor Vehicles personnel who have assisted in the planning and execution of the project, most of whom cannot all be individually named.

Special mention must be made, however, of John O'Brien, Division of Drivers Licenses, who was responsible for much of the initial planning stages of the project.

Also, the Department of Motor Vehicles wishes to express its appreciation to Charles E. Schott, President of the Long Beach Safety Council and his staff of motorcycle instructors who so ably presented the course of instruction to the examining personnel. The instructors were: William Meyer, Robert Garrene, Richard Johansen, George LaPay, Gilbert Smith and Richard Beegle.

In addition, special thanks to Dr. Arthur Steiner, Dean of Continuing Education, Long Beach Community College (Business and Technical Campus), for permitting use of facilities for seven motorcycle training sessions held on that campus.

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INTRODUCTION

This introductory chapter is divided into three sections: (1) an overview of how motorcycle driver licensing evolved in California, (2) a description of the present problem, and (3) goals and objectives of this traffic safety project.

Overview

Motorcycle registrations in California increased dramatically during the early 1960's and, unfortunately, so did the numbers of motorcycle-related traffic accidents and fatalities. Over a period of five years, 1961 to 1966, California's motorcycle population had increased nearly 200 percent. As of 1966, almost 315,000 motorcycles were registered with the California Department of Motor Vehicles. By mid-1974 that total stood at nearly 600,000.[1]

This phenomenal increase in motorcycle registrations, coupled with a corresponding increase of motorcycle-related accidents and deaths, caused considerable concern among traffic safety educators, legislators and licensing administrators. This rapid proliferation of motorcycles, of course, was not just occurring in California; other states throughout the nation were also reporting a similar experience. In short, this sudden surge in the popularity of the motorcycle soon became widely discussed and understood among traffic safety circles as the "motorcycle problem."

[1] This figure does not include motorcycles registered for use off highway. As of June 1974, off-highway motorcycle registrations totalled 115,000.

So, by the mid-sixties, it had become quite clear to California traffic safety experts that something had to be done relative to the motorcycle problem. But what should be done first? To be sure, something must be done, but what was known about the problem?

To deal with these questions, one of the first steps taken in California was an attempt by the Department of Motor Vehicles to find out what literature existed on the subject of motorcycle safety, especially in the area of driver licensing. However, as most readers may already know, very little information was available on the subject. Therefore, the California Department of Motor Vehicles decided to launch a pilot investigation concerning factors related to motorcycle accidents. The primary aim of that study was to define the extent of the motorcycle problem and isolate possible problem areas for further research and action.

The results of that pilot investigation, known as the "California Motorcycle Study" were published in July 1968.(2) A number of important findings and recommendations were made as can be seen in the following paragraph quoted from that report.

> "In the present writers' estimation, the most important finding of this study concerns the role of age and experience in motorcycle accidents and traffic convictions.

(2)Harano, R. M. and Peck, R. C.: The 1968 California Motorcycle Study. California Department of Motor Vehicles, Sacramento, California.

Both the regression and chi-square analyses suggest that lack of skill or inexperience are more important factors in motorcycle accidents than in non-motorcycle accidents. Since level of skill is a partial function of vehicle familiarity, training and licensing more effort in these areas is indicated. Currently, any person who possesses a valid California drivers license is authorized to drive a motorcycle in this state, even though licensed on the basis of performance only in a passenger car. The data indicates that a person who can drive a car safely may not always be able to drive a motorcycle safely. Consequently, serious consideration should be given toward insuring that persons not be authorized to drive motorcycles unless they possess the requisite skill. This pilot study has pinpointed a problem area relating to motorcycle accidents. The time has come for future driver control research to evaluate the relative effectiveness and costs of various training and licensing programs specifically designed for the motorcycle operator."

On November 13, 1968, four months after the California Motorcycle Study was published, California law was subsequently changed to provide a special license class governing the use of motorcycles. So, at this writing, the Department of Motor Vehicles has been examining and licensing persons for motorcycle operation for a period of six years.

The Problem

Although California law was changed in 1968 to provide a special license class for motorcycles, the examination procedure, due to budgetary and time constraints, had not changed appreciably from what was implemented upon the enactment of this law.

The manner in which the motorcycle testing procedure was implemented in 1968 was done primarily through printed instructional materials i.e., procedural memoranda, manual publications, etc. Consequently, no formal training was afforded the examining personnel who had to administer the motorcycle skill tests. The major reason this training method was employed was due to the aforementioned budgetary considerations which precluded both the organization and presentation of a course of the magnitude required to educate the examining personnel to conduct a more sophisticated motorcycle test.

It should be mentioned, however, that since June of 1969, the department introduced all newly hired examiners to motorcycle operation while attending the Examiner Training School based at its Sacramento Headquarters. The motorcycle training for these new employees consisted of a short field trip to the California Highway Patrol Academy. At the Academy, professional motorcycle instructors lectured and demonstrated motorcycle operation to the examiner trainees. This arrangement, however,

was not always satisfactory. Variable work schedules at the Academy were often times not compatible with D.M.V. class schedules. Nevertheless, this cooperative effort given by the California Highway Patrol Academy proved extremely helpful to the examiners and was greatly appreciated by the Department of Motor Vehicles.

Goals and Objectives

The department's examining personnel has conducted over 550,000 motorcycle skill tests since adopting its special procedures for motorcycle licensing. During a recent twelve month period, 1 May 73 to 30 Apr 74, examiners conducted 133,050 motorcycle skill tests.(3) Approximately 720 departmental employees were involved with this testing. This represents a substantial number of traffic safety-related contacts. It was reasoned, therefore, that the opportunity for achieving traffic safety goals in these instances would be greatly enhanced by the presence of personnel thoroughly trained in this specialized area of motorcycle operation.

Because the motorcycle testing system and method of examiner training, in its present form, was not adequate, it became the department's goal to implement, as quickly as possible, a motorcycle testing procedure that would be responsible to the obvious requirement that a motorcyclist's skill be thoroughly evaluated. Two specific objectives of

(3) The number of motorcycle tests given during this period by each office state-wide is shown in Appendix D, page 62.

this project were: (1) to provide the approximate number of 720 examining personnel staffing the department's 146 field offices located throughout the state with a six-hour training course in motorcycle operation specifically designed to enable examiners to effectively evaluate, through their increased knowledge of motorcycle skills and principles of operation, an individual's ability to properly control and utilize this type of vehicle, and (2) to purchase and install motorcycle skill testing equipment i.e., traffic cones, paint striping, etc., in appropriate office locations, thus enabling the trained examining personnel to conduct more meaningful tests at the conclusion of their training.

Part I: Project Development

Instructional Modality

Great deliberation preceded the selection of the instructional modality to be employed at the proposed motorcycle training sessions. Various alternative methods were considered and rejected. The department did not see merit in the proposal that a few examiners be trained for the exclusive purpose of giving motorcycle tests. Transfer of these employees to another office might leave their former locations completely devoid of talented motorcycle licensing personnel.

Retirements and resignations could also adversely affect the ability of an office to render full and adequate service in the matter of motorcycle license examining. The suggestion that a cadre receive specific motorcycle instruction was likewise undesirable as instruction loses its impact with each removal from the original source. Furthermore, this procedure would be too time consuming.

To insure that the level of service to the public was not lowered by use of skeleton crews, it was decided that all of the training sessions would be held on Saturdays. For this reason, a great portion of the monies allocated to the project was used to pay salaries at the established rate of overtime for all participants who attended the training sessions. In addition, monies were allocated for the participants traveling

to and from the training areas. However, by dispersing the training over seven widely separate locations, travel and overnight lodging expenses for the examining personnel were kept to a minimum.

Selection of Examining Personnel

Of the 720 employees identified as being directly involved with the issuance of drivers licenses in California, 465 have the civil service classification of Drivers License Examiner.(4) While it was obvious that examiners should attend this course, the Department of Motor Vehicles was also convinced that two other civil service job classifications should likewise participate in this educational venture, since they must at all times be ready to give driver license examinations. These are: (1) Motor Vehicle Representative II's, who function as drivers license supervisors in medium size field offices or work solo on travel runs which provide driver licensing services to communities located in remote areas of the state and (2) Manager I's, in charge of small one or two man field offices or drivers license sections in large size field offices. The logic behind educating employees holding these two job classifications just mentioned, was considered reasonable and proper; because all those involved with the issuance of driver licenses should be skilled in this specific area of motorcycle examining.

(4)When this traffic safety project began 1 Aug 73, there were 505 Drivers License Examiner positions available. However, during the last quarter of Fiscal Year 73/74, 40 examiner positions were abolished. No attempt will be made here to expand upon the reasons these positions were abolished; except to say it resulted from two programs recently implemented by the department which reduced the total number of driving tests administered annually.

Of the 720 California driver licensing personnel scheduled for training under this special project, 702 (97.5%) were in attendance. The number of persons scheduled and subsequently trained in each job classification is shown in Table 1.

Table 1. - Number of Examining Personnel Scheduled and Trained by Job Classification

JOB CLASSIFICATION	NUMBER SCHEDULED	NUMBER TRAINED
Manager I	105	100
Motor Vehicle Representative II	150	143
Drivers License Examiner	465	459
Total	720	702

Selection of Training Consultant (Contractor)

Prior to executing this traffic safety project agreement with the California Office of Traffic Safety, the Department of Motor Vehicles determined that it did not have personnel adequately trained in the art of teaching motorcycle operation and safety; at least not from the standpoint of having the necessary level of professional competency required to properly present this special training course to its own examining staff. So consistent with the traffic safety project agreement, it was decided that the actual training be conducted by motorcycle experts, i.e., private entrepreneurs, law enforcement personnel, traffic safety educators, etc. Therefore, a Request for Proposal was prepared, pursuant to the assistance of a qualified contractor to provide the Department of Motor Vehicles' examining personnel with a training course in motorcycle skill and principles of operation.

A screening process was accomplished by the Department of Motor Vehicles as a preliminary to the issuance of a Request for Proposal. This consisted of contacting approximately forty-five traffic safety-oriented agencies and individuals in which each was asked to indicate their interest in participating in this educational venture. Initially, thirty-seven positive responses were received and all were invited to submit a proposal relative to the development and presentation of the motorcycle training course. During the proposal period (all proposals had to be submitted within 30 days), a bidders' conference was held in Sacramento. This provided an opportunity for prospective contractors to present serious questions pertaining to their intended participation in the project and, of course, ask technical questions relative to the Request for Proposal. Eight organizations were represented at this conference. Subsequently, six proposals were submitted to the department wherein each was rated by an Evaluation and Selection Committee. This evaluation process, including development and application of evaluation and ranking criteria, was as objective and comprehensive as practical. Finally, Long Beach Safety Council, Inc., Long Beach, California, was selected and awarded the contract to conduct the motorcycle training phase of this traffic safety project.

Training Risks and Liability Insurance

Prior to executing a contractual agreement with respect

to the conduct of the motorcycle training phase of this project, the Department of Motor Vehicles emphasized to its own examining personnel, as well as all prospective contractors, that the primary aim of this training endeavor was to teach the examining personnel to be "proficient observers" and not how to ride motorcycles. Just as is the case in other examining tasks, knowledge of the rules of the road, familiarity with certain primary aspects of the vehicle to be used in future tests, appreciation of the proper operating techniques, etc., are all that are required to enable the examiner to conduct an effective examination. It was estimated therefore, that these qualities could be learned through observation of and discussion with professionally adequate motorcycle instructors. Nevertheless, the Long Beach Safety Council believed it important to the training program that examiners be permitted to ride a motorcycle and subsequently convinced the Department of Motor Vehicles to allow this activity.

Because it was known that a vast majority of the examining personnel did not regularly ride motorcycles, permitting this activity would entail a certain level of risk. After much discussion and careful consideration, the Department of Motor Vehicles agreed to permit this activity provided that; (1) riding a motorcycle was made voluntary and not mandatory, (2) individuals who volunteered to ride be permitted to do so under close supervision inside the parking lot only, and (3) Long Beach Safety Council furnish a Certificate of Insurance

with liability limits of $100,000/ $300,000/ $50,000. The Safety Council agreed to these provisions and, we are pleased to report, that although a few upsets did occur for those examiners attempting to ride a motorcycle, many for the first time, no serious injuries resulted. (See photo's in Appendix A, page 50.)

Training Schedule and Selected Locations (Sites)

There are 146 permanent field offices spread in communities throughout the State of California. Additionally, travel crews provide driver license services to 53 other remote communities that have no field offices. These field offices and travel locations are divided along geographical lines, into 14 managerial districts, each headed by a District Manager.

Therefore, it was the District Managers who undertook the primary task of getting the scheduled number of examining personnel to the selected training sites at the appointed time and dates. With the exception of Long Beach Community College (Business and Technical Campus), all locations for conducting the motorcycle training sessions were held at departmental field offices. The seven locations chosen were: Long Beach Community College (BTC), and the department's field offices at San Diego, San Bernardino, Bakersfield, Oakland, Sacramento and Redding. The dates, times, number of participants and map relative to the state-wide training schedule are shown in Appendix C, pages 59 and 60.

Training Site Preparation

The District Managers with the six field offices under their jurisdiction designated as motorcycle training sites (mentioned above), made all necessary arrangements in preparing these offices for the training classes. In addition to these tasks, a District Manager or his authorized representative was present at each training session to (1) certify attendance, (2) assist the Long Beach Safety Council's instructors in setting up classroom equipment, i.e., blackboard, movie projector, screen, etc., and (3) monitor the training activities. However, no assistance in setting up the classroom at Long Beach Community College was needed, as Long Beach Safety Council was already using this facility as part of a regular on-going motorcycle training program they were conducting at the college.

Participants' Transportation

Because of the "energy crisis," the Department of Motor Vehicles encouraged all participants traveling to and from the training sites to organize car pools. In many instances it was possible to use state-owned vehicles. In either event, this activity was extremely successful, as only 39.06% of the funds allocated for travel expenses were expended. The total project costs are shown in Table 2, page 31.

Part II: Presentation of the Training Course

Work Plan

In executing the work under this traffic safety project, Long Beach Safety Council (hereafter referred to as the "Safety Council") furnished the necessary qualified instructors, films, motorcycles, instructional materials and other services, and in consultation with the California Department of Motor Vehicles conducted nineteen motorcycle training sessions, six hours in length, at seven separate locations throughout the state.

The Safety Council designated six professional motorcycle instructors to conduct the state-wide training course. Two instructors were assigned to each training location. On eight occasions, two training sessions were conducted concurrently. Consequently, nineteen training sessions were completed over a period of eleven Saturdays. Because no more than four instructors worked on the same day, it was possible to keep two instructors on standby, ready to fill in behind any of the four "regulars" in case one or more of them were for any reason incapacitated.

The six-hour motorcycle training course, conducted by the Safety Council, was divided into two three-hour segments. The first three hours were devoted to in-class instruction followed by 3 hours of field operations. The field operations were always conducted on the vacant parking lot at each training location.

Specific Task.Elements

In completing the work under this project, the Safety Council undertook the following task elements and methodologies:

A. Instructed the examining personnel, relative to the methods, techniques and skills required to safely and successfully operate a two-wheel motorcycle.

B. Instructed the examining personnel, on the historical trends in the use of motorcycle for recreational and transportation purposes.

C. Developed and administered to the examining personnel a pre-test and post-test. (The content and results of these tests are shown in Appendix E, pages 65 - 68.)

D. At each training location, provided films, printed materials, i.e., books, pamphlets, statistical data, etc., and twelve motorcycles rated at 100 cc. (Instructional materials and photographs of training activities are shown in Appendix A, pages 42 - 50.)

E. Lectured, discussed and otherwise portrayed to the examining personnel on the following subjects:

1. An explanation of the controls.
2. Proper mounting of the vehicle.

3. Proper procedure for starting the engine.

4. Proper use of the throttle and clutch.

5. Proper use of the brakes (normal and emergency stops).

6. Use of safety aids (mirrors, cut-off switch, lights, horn, etc.).

7. Demonstration of proper and improper skilled maneuvers.

8. Hazardous riding situations.

9. Emergency situations.

10. Defensive riding techniques (techniques peculiar to motorcycle riding).

11. Importance of protective apparel (helmets, gloves, goggles, footwear, etc.).

F. Instructed the examining personnel on the frequency, type and severity of accidents involving motorcycle riders.

G. Discussed with the examining personnel the critical problems involved in mixing motorcyclists with the demands and hazards of modern day traffic.

Approximately ninety percent of the Safety Council's time was devoted to these task elements listed above.

In addition, two other tasks were also required of the Safety Council. These were:

A. Analyze and recommend improvements or changes in administering the motorcycle skill test.

B. Analyze and recommend the type of testing equipment to be utilized in administering the motorcycle skill test, i.e., traffic cones, paint (line) striping, etc.

Approximately ten percent of the Safety Council's effort was devoted to this portion of the work.

Upon completion of this system analysis of the motorcycle skill testing process, the Safety Council submitted its recommendations to the Department of Motor Vehicles for further study and evaluation. The motorcycle skill test system subsequently adopted by the Department of Motor Vehicles is fully described on page 21 of this report.

Classroom Training Procedures

At all training sessions throughout the project (after the instructors introduced themselves), the first order of business was to administer the pre-test and take attendance.

During the in-class instruction phase, the two instructors would alternately lecture to and discuss with the class of examiners all the various facets involved in motorcycle operation.

At each training session, a motorcycle was put on display in the classroom and used most effectively by the instructors as a visual aid. By having a motorcycle in the classroom,

the instructors could readily point out the various controls, safety aids and design characteristics of the machine.

Three short films were shown at various points during the class period. One film, "Laws of Nature" dealt with a range of subjects relative to the "physics" involved in motorcycle riding, e.g., stopping distances, friction, force of impact, centrifugal force, center of gravity, etc.

A second film, "Operation of Controls," illustrated the functions of the controls and their proper use in motorcycle operation. Also, motorcycle care and maintenance were discussed in the film.

The third film, "Attitude in Motion," emphasized the role of motorcycle education in general and how it impacted on the community of Long Beach, California in particular.

These three films (mentioned above) proved extremely helpful in stimulating class discussion. After each showing, a number of questions would be raised by the examiners and quite often a lively discussion on the issue at hand would ensue.

The pre-test too, would usually set off a lively question-and-answer period. For example, 84% of all the examiners attending these sessions had never heard of the two second rule

commonly used today by traffic safety educators instead of the old rule-of-thumb, one car length for every 10 mph of speed.

In short, judging by the enthusiasm shown by the class of examiners, the in-class phase of the training program was most successful.

Field Training Procedures (Hands-on phase)

At the beginning of each practical (hands-on) session, each participant had a red, yellow or green ribbon pinned to his lapel. Red indicated those persons who had never ridden a motorcycle. Yellow was for individuals with limited riding experience and green for those who regularly rode motorcycles and possessed a class 4 (motorcycle) license.[5] The vast majority of all participants wore red ribbons. This color coding system served to alert the instructors as to which individuals might need the most assistance while operating the cycle.

The field training was divided into three phases. The first phase, approximately 45 minutes, was devoted to the basic operations of the machine. All participants went through the actual procedures of starting, gear shifting, etc., while the motorcycle was securely situated upon the center kickstand.

[5]Of the total of 702 examining personnel trained under this project, 180 individuals, 26% had a valid Class 4 endorsement on their license.

The second phase, approximately one hour, was devoted to demonstrations by the instructors of the proper skilled maneuvers and improper unskilled maneuvers. At this point, the participants were provided an evaluation score sheet and practiced scoring the riding performance of the instructors as they simulated the varying riding skills of experienced and inexperienced applicants. The instructors also used some of this time in demonstrating stopping distances from speeds up to 25 mph. This consisted of four braking demonstrations. These were: (1) front wheel brake only, (2) rear wheel brake only, (3) combination front and rear brakes, and (4) a controlled rear wheel skid.

The third phase, approximately one hour, was devoted to examiners riding the motorcycle. The examiners had now been familiarized with the operation of the cycle, so they were encouraged (on a volunteer basis) to ride around the parking lot and attempt to execute circles and cone weaves. It is estimated that approximately 40% of those that volunteered to go through this riding experience were doing so for the very first time. As these volunteers rode around a prescribed course, the others practiced scoring the riding abilities of the inexperienced examiners.

At the conclusion of the field operations, the participants were reassembled into the classroom and given the post-test and filled out the course evaluation sheet.

Part III: Development of Motorcycle Skill and Road Test System

Authority

Section 12803 of the California Vehicle Code requires that each applicant for a driver's license must be examined before the license is issued. Section 12804 of the Vehicle Code specifically requires that an applicant be given an examination appropriate to the type of vehicle he desires to operate. The examination must include a test of the applicant's knowledge and understanding of the provisions of the Vehicle Code governing the operation of vehicles upon the highway. Furthermore, the applicant is required to give an actual demonstration of his ability to exercise ordinary and reasonable control in operating a vehicle by driving the same under the supervision of an examining officer. This includes any two-wheel motorcycle classified under Section 12804 as a Class 4 license.

Drivers License Classifications

As provided by Section 12804 of the California Vehicle Code, the regular driver's license is issued in one or more of four separate classes, based on the type of vehicle or vehicles in which the driver has qualified. These are as follows:

Class 4. This class permits only the operation of two-wheel motorcycles. It can be the sole classification of a license or it can be added as an endorsement to any other class of license. It includes two-wheel motorcycles

equipped with a sidecar, but does NOT include three-wheel motorcycles (or any cycles designed to operate on more than two wheels. The latter vehicles are included under Class 3.).

Class 3. This is the basic license, and permits the driving of three-axle house cars and any single motor vehicle having not more than two axles. It includes three-wheel motorcycles, but does NOT include two-wheel motorcycles. It also permits the towing of any single vehicle weighing less than 6,000 pounds gross.

Class 2. This class, in addition to the vehicles described for Class 3, permits the driving of any bus, any farm labor truck and any single vehicle with three or more axles. It does NOT permit the operation of two-wheel motorcycles or the towing of a vehicle weighing 6,000 pounds gross or over.

Class 1. This class, in addition to the vehicles described for Class 2 and 3, permits the driving of any combination of vehicles, including the towing of a vehicle weighing over 6,000 pounds gross, but does NOT permit the operation of two-wheel motorcycles.

Therefore, authority to operate a two-wheel motorcycle in a Class 4 license category (explained above) may be granted by

endorsement on a Class 1, 2, or 3 license upon completion of all the appropriate examinations.

All applicants, applying for just the motorcycle license (Class 4 only), are required to take a motorcycle road test in addition to the motorcycle skill test.

Motorcycle Skill Test

The motorcycle skill test developed as a result of this traffic safety project, requires an applicant to demonstrate his ability to exercise ordinary and reasonable control in operating and balancing a motorcycle, while continually changing both his direction of travel and degree of lean. The sequence and contents of the skill test are as follows:

Static Test. The applicant is asked to identify and explain the use of the following controls: Starter, choke, clutch, throttle, gear shift and brakes.

Serpentine Ride. The applicant is asked to weave through a row of 5 traffic cones, spaced 12 feet apart and, at the end of the row of cones, to begin the Circle Ride (described next).

Circle Ride. The applicant is asked to ride around a circle (within a diameter of 20 to 24 feet), keeping within the tracking path (2 feet wide) and return to the

starting point by weaving once again through the row of 5 traffic cones (Serpentine Ride).

Slow Ride. The applicant is asked to ride slowly (2 to 3 mph) for a distance of 50 feet between two parallel lines spaced one foot apart, and continue around the circle (in a direction opposite from his first circle ride) and return on a slow ride between the opposite set of parallel lines.

Obstacle Ride. The obstacle ride is accomplished through the strategic positioning of traffic cones, which the applicant encounters during both the Circle Ride and Serpentine Ride.

Gear Shift Ride. The applicant is asked to travel in a straight path for approximately 150 feet, but in no case less than 50 feet, shifting gears up as he goes. He is to make a sharp turn (left or right) at the end and return on the same path, shifting down as he goes, to end at a smooth stop at the starting point.

NOTE: The gear shift ride is executed in an open area of the parking lot and not on the skill test pattern itself.

The skill tests (described above) are administered by instructing the applicant only twice. This is illustrated in Appendix B, pages 56 and 57.

Motorcycle Road Test

When the applicant is to be tested in a vehicle which is of a type not normally constructed to provide for passengers, i.e., invalid vehicles, self-propelled cranes, special construction equipment, etc., but including all motorcycles whether or not equipped with sidecars or passenger seats, the examiner observes the applicant's driving by standing at a pre-selected vantage point from which the greatest portion of the test is visible. This is ordinarily at the intersection closest to the office which affords the best visibility.

The examiner instructs the applicant to follow a route designed to keep the rider in the examiner's view for the longest period, and includes a right and left turn maneuver at the intersection where the examiner is standing.

Applicant's Performance During Tests

The applicant should be able to execute all maneuvers required during all skill tests (described above), without removing his feet from the footrests, without toppling or excessive wobbling or knocking over the traffic cones. The examiner also notes how well the applicant coordinates gear shifting with the use of the throttle and method of brake operation.

When a road test is given, the examiner scores the applicant for: (1) proper lane positioning (avoids grease track), (2) proper use of turn signals, (3) turning corners from proper lane, (4) attention to number and speed of nearby vehicles, (5) attention to pedestrians, and (6) use of safe distances when following and passing vehicles and other objects.

Method of Scoring Tests

If, in the examiner's opinion, the applicant's demonstration of knowledge during the static test or his performance in the skill or road test is unsatisfactory for reasonable and safe operation of a motorcycle, the test is scored as a failure. The examiner advises the applicant as to the causes of his failure and directs his attention to items needing improvement.

Skill Course Pattern

Each motorcycle skill course pattern utilizes 20 traffic cones, 4 parallel lines and 2 concentric circles. The parallel lines are 50 feet each in length. Of the two circles, one circle has a diameter of 20 feet and the other a diameter of 24 feet. These parallel lines and circles are marked by white painted lines (4" wide), and (if placed end to end) are equal to a single line extending a distance of approximately 338 feet.

The motorcycle skill course pattern is painted on existing surfaces of field office parking lots, in an area best suited for conducting motorcycle skill tests. In other words, the selected area in the parking lot, must be as free as practicable from hazards posed by vehicular traffic, spectators, etc.

Two motorcycle skill course patterns were developed. One skill course, designated as Motorcycle Skill Course #1, is installed at offices that have ample space in the parking lot. Offices with small parking lots may install an alternate test pattern, designated as Motorcycle Skill Course #2. Both motorcycle skill course patterns are illustrated in Appendix B, pages 54 and 55.

Skill Test Equipment

The skill test equipment purchased under this traffic safety project agreement, to lay out each motorcycle skill course pattern for use at appropriate field offices throughout the state, totaled 4,000, 7 inch fluorescent traffic cones and 338 gallons of white traffic paint. Specifications for the traffic cones and paint are shown in Appendix B, pages 52 and 53.

PRE-TEST AND POST-TEST RESULTS

At the beginning of each training session, a 15 question pre-test was administered to the participants. Then a post-test, containing 15 questions paralleled to the pre-test, was administered at the conclusion of each session. The purpose of this testing procedure was to determine the level of knowledge (of motorcycle operation) the participants possessed prior to the course of instruction and, of course, to measure the extent of learning that took place as a result of this educational venture.

For the pre-test, the number of questions answered correctly by the entire group of 702 participants averaged 9. The group average for the post-test was 13 correct answers. The distribution of responses for both tests are shown in Appendix E, pages 65 - 68.

PARTICIPANTS EVALUATION OF TRAINING COURSE

At the conclusion of each training session, immediately following the post-test, each participant was asked to fill out an evaluation sheet. The evaluation sheet consisted of four questions relative to the effectiveness of the training course. The participants rated the various points covered during the course on a scale of excellent, good, fair, poor and unsatisfactory. Also, a space was provided for any additional comments they wished to make relative to the course. On this latter item, nearly half of the participants responded. Here are a few of their comments:

"This was an excellent program and it needs to be implemented as part of our motorcycle testing procedures - Now!"

"More training is needed. Although the quality of this training course was excellent, six hours is not enough."

"This course was most informative. It was the first time I ever had the opportunity to operate a motorcycle. Now at least I know what to look for when conducting a motorcycle skill test."

"As a former motorcycle police sergeant for 17 years and founder of a police motorcycle drill team, I feel that training of this kind should have been given to all examiners year ago."

And as a final summation, one examiner wrote:

> "Have ridden motorcycles for many years and yet this training course brought out several factors in riding motorcycles that I was completely unaware of before."

A distribution of responses for the first four items on the evaluation sheet, as rated by the examiners, are shown in Appendix E, page 69.

PROJECT COSTS

Of the total Federal funds ($95,267) allocated for the conduct of this traffic safety project, 75.82% ($72,233) was expended.

Consequently, the sum of $23,034 remained unencumbered. The reason this amount of money was not expended was because the estimated costs in two categories were less than at first anticipated. These categories were: (1) travel expenses for the examining personnel and (2) motorcycle skill test equipment, i.e., traffic cones and traffic paint.

The total funds allocated and actual funds expended for all cost categories for the conduct of this project are shown in Table 2.

Table 2. - TOTAL PROJECT COSTS

COST CATEGORY	FUNDS ALLOCATED	FUNDS EXPENDED	DOLLAR CHANGE
A. Personnel Costs	$46,717	$47,198	- 481
B. Travel Expenses	$ 9,278	$ 3,624	+5,654
C. Contractual Services	$10,000	$ 9,924	+ 76
D. Other Direct Costs (Testing Equipment)	$24,600	$ 6,767	+17,833
E. Indirect Costs (10% Overhead)	$ 4,672	$ 4,720	- 48
Total	$95,267	$72,233	+23,034 (unencumbered)

SUMMARY AND CONCLUSIONS

It should be mentioned that this motorcycle training project generated a great deal of interest among departmental employees and a number of persons outside of the Department of Motor Vehicles.

When it was publicized, via a news release, that the Department of Motor Vehicles was planning a motorcycle training program for its examiners, great numbers of employees in various job classifications, i.e., vehicle registration supervisors, clerical personnel, driver improvement analysts, field office managers, etc., and persons outside of the department, i.e., high school driver education teachers, law enforcement personnel, members of motorcycle clubs, associations, etc., expressed a genuine desire to attend the motorcycle training sessions as observers only. Under these circumstances, there existed a very real possibility that the number of observers would outnumber the participants and thereby cause a serious distraction to instructors and student alike. So for this reason, it became necessary for the department to ascertain that only the scheduled examining personnel and certain managers designated to monitor the motorcycle training sessions be admitted to the class. However, exceptions to this rule were made for members of the news media. On at least two occasions, the various training activities were filmed by television crews and aired on subsequent newscasts. Also, a number of local newspapers reported on these activities.

The two primary goals set forth in the traffic safety project agreement have been largely accomplished. These were: (1) to train the driver licensing personnel in motorcycle safety and principles of operation, and (2) to purchase and install appropriate motorcycle skill testing equipment, i.e., traffic cones (pylons) and paint to adequately lay out the skill course.

It should be recognized that individual field offices throughout California vary from each other in physical facilities, office layout and volume of work. Therefore, implementation of the skill testing equipment cannot in all practicality be immediately realized. Such factors as policy decisions relative to securing the necessary labor to paint stripe each skill test course, preparing procedural instructions for the examining personnel, etc., will necessarily require a transition period before the skill test can be enhanced and put into full operation state-wide. At this writing, all offices have received the traffic cones, but only about two-thirds have begun utilizing them. Arrangements for completing the line (paint) striping has just recently begun and it is estimated that this task will be completed by the end of this year or the early part of 1975.

To ensure that maximum uniformity is maintained in this vital area of motorcycle skill testing, the California Department of Motor Vehicles adopted a basic skill test system

that can be modified or tailored to fit, within reasonable limits, into the parking lot areas of nearly all its field offices. There are, of course, a few field offices where space is totally inadequate, especially at small size offices and most travel locations. For those field offices and travel locations that cannot implement the new skill test system, a motorcycle skill test which requires no extra equipment and no prescribed course will be administered. In the meantime, the department is studying ways on how these individual office problems relative to motorcycle skill testing can best be remedied. A number of possibilities currently being explored are: (1) secure off-site area, (2) schedule tests only at certain times of the day and days of the week, and (3) refer applicants to a neighboring office.

Except for light rain that fell during the very first session at Long Beach, California, weather conditions were ideal throughout the entire project.

All the examining personnel showed great interest and enthusiasm for this motorcycle training course. This was especially true for the hands-on training phase where they all had the opportunity to actually operate a motorcycle, most for the first time. The fact that examiners knew very little about motorcycle operation was obvious by the kinds of questions they raised during both the classroom and field training sessions. Heretofore, many examiners did not know

the rudiments of gear shifting and other basic principles involved in the operation of motorcycles. Therefore, it is obvious that this special training effort has served to greatly enhance the abilities of examiners to more confidently and knowledgeably evaluate an applicant's skill in operating a motorcycle.

The content of the six-hour motorcycle course of instruction, presented to the examining personnel during this traffic safety project, has now been phased into the regular curriculum of the Drivers License Examiner Training School based at the Department of Motor Vehicles headquarters in Sacramento.

RECOMMENDATIONS

A problem has surfaced relative to the new skill course pattern developed under this project, in administering the motorcycle skill test to those applicants who appear for the test on modified motorcycles, e.g., choppers.

Experience has already indicated that a number of these motorcycles have been modified to such an extent, that it is very difficult (often impossible) to manipulate these machines through the skill course pattern. In addition to the obvious problem of a longer wheel base, many of these vehicles appear highly unstable and difficult to balance; especially at low speeds.

So, for the time being, the department will conduct a special skill test for applicants with modified motorcycles; that is, if, in the opinion of the examiner, a particular motorcycle is so altered that it cannot be successfully negotiated through the skill course by a reasonably competent rider. The applicant will then be tested for essentially the same maneuvers as the regular skill test, in an open area of the office parking lot, without the use of special testing equipment, i.e., traffic cones, etc.

It is therefore, strongly recommended that a study be made in the near future, to examine the basic safety performance of modified motorcycles. It would appear to this writer, based

on empirical evidence, that a number of motorcycles are being so radically modified by their owners, that it may violate the best interests of vehicle safety.

APPENDIXES

APPENDIX A

COURSE OUTLINE

DEPARTMENT OF MOTOR VEHICLES LICENSING PERSONNEL

MOTORCYCLE TRAINING PROJECT

CLASSROOM OPERATIONS (3 Hours)

A. Call to Order:

Introductions of Instructors
Course Objective
Explanation of Color Coding
Introduction to the Motorcycle and Statistics
Pre-Test
FILM: LAWS OF NATURE
Discussion

B. Introduction to the Motorcycle

1. Fundamentals of controls
2. FILM: OPERATION OF CONTROLS
3. Discussion:

a. Clutch
b. Throttle
c. Front Brake
d. Gear Shift Lever
e. Gear Pattern
f. Rear Brake

4. Position on Motorcycle

a. Upright position, shoulder slope, elbows, head up, knees in against gas tank.

b. RIGHT FOOT:
1. Arch of foot on footrest
2. Toe ½" to 1" from gear shift lever
3. Foot horizontal to ground level.

C. Hazardous Riding Situations

Turning vehicles, approaching from 90 degree angle, backing from driveways, driving near parking lane, car door opening, braking in curve, following another vehicle, passing on right, driving between traffic, night driving.

D. Emergency Situations:

Intersection pull-out, high speed, lane changing, rear wheel skid, crest of hill, passing, braking on slippery surface, bridge grating, manhole covers, painted lines.

E. Defensive Driving Techniques
Courtesy, plan ahead, see and be seen

F. FILM: "ATTITUDE IN MOTION."

LUNCH

FIELD OPERATIONS (3 Hours)

A. Proper procedure for starting the engine (F I L S T)

1. Fuel
2. Ignition
3. Light
4. Starter
5. Throttle

B. Improper procedures (What to look for)

1. Failure to start motor
2. Know sequence in starting
3. Forgot ignition switch
4. Forgot fuel switch
5. Didn't kick hard enough
6. Didn't twist throttle enough
7. Throttle wide open
8. Starting in gear
9. Couldn't find neutral

C. Proper movement procedure (CF/T/CF)

1. Clutch in
2. First gear
3. Throttle (one-fourth turn)
4. Clutch out (slowly through friction range)
5. Feet on footrest

D. Improper procedures

1. Grinds gears
2. Failed to depress clutch fully
3. Jazz Throttle
4. High RPM when engaging gears
5. Start with one foot on ground
6. Get feet up too soon
7. Let clutch up to fast
8. Jerky start
9. Kill engine
10. Too low RPM
11. Too fast a start
12. Poor position on motorcycle

E. Stopping procedures

1. Clutch in
2. Brake (front)
3. Feet out

F. Improper procedures

1. Failure to depress clutch
2. Failure to retard throttle
3. Squeezing too hard on front brake
4. Using improper braking sequence
5. Not getting feet out soon enough
6. Not stopping smoothly
7. Killing engine

G. Obstacles

1. Straight line riding
2. Acceleration and deceleration
3. Use engine compression
4. 90 Degree turns
5. 180 Degree turns
6. Shifting up
7. Shifting down
8. Serpentine
9. 360 Degree turns
10. Cone weave

H. Braking (Executed at 20 miles per hour)

1. Rear brake only
2. Front brake only
3. Combination rear and front brake
4. Controlled rear wheel skid

I. Post-Test

J. Evaluations

COMPLETION AND ISSUANCE OF CERTIFICATES

ADJOURN

CALIFORNIA MOTORCYCLE TRAINING PROJECT

Instructional Materials

The printed materials and films utilized during the six-hour course of motorcycle instruction are listed below.

Handbooks and References

Student Workbook and Defensive Driver's Manual, Motorcycle Supplement 1st Edition
. . . National Safety Council Driver Improvement Program

How to Ride a Mini Bike
. . . American Honda Motor Company, Inc.

Intelligent Motorcycling by William Kaysing
. . . Parkhurst Publishing Company, Long Beach, California

California Vehicle Code Summary
. . . California Department of Motor Vehicles

Motorcycle Facts
Sources: . . . National Safety Council, California Highway Patrol, Motorcycle Industry Council, California Department of Motor Vehicles

Films

Operation of Controls
. . . American Honda Motor Company, Inc.

Laws of Nature
. . . American Honda Motor Company, Inc.

Attitude in Motion
. . . American Honda Motor Company, Inc.

MOTORCYCLE FACTS

In 1972, 584 (21.3%) of the nation's 2,747 motorcyclist fatalities occurred in California.

Motorcyclists represent over 8% of the killed or injured traffic accident victims, but almost 12% of the traffic accident fatalities.

Valid and reliable statistics are not available on which to calculate a motorcycle mileage death rate, but an estimate shows the 1971 California motorcycle mileage death rate to have been 15.5 deaths per 100 million miles of travel compared to 3.7 for all motor vehicles.

In 1972, the fatality-injury ratio in California was 1 our of 35 for motorcyclists compared to 1 out of 61 for motor vehicle occupants.

In over 60% of the multi-vehicle fatal and injury accidents involving a motorcycle, the non--motorcycle driver was at fault.

Preliminary statistics from the Office of Traffic Safety Study of motorcyclists killed in traffic accidents in California indicate about 50% did not have motorcycle endorsement on their license.

Motorcycle effectiveness studies indicate fatalities, particularly those resulting from head injuries, are decreased when helmets are worn.

Approximately 25% of the motorcycle drivers involved in accidents in California wear helmets.

Motorcyclists with less than six months riding experience have an accident rate double that of more experienced riders.

Motorcycle Registration (not including off-road vehicles) in California has increased almost 15% during the past three years.

Daytime motorcycle headlight usage results in a dramatic decrease in involvement in accidents.

The visibility of the motorcyclist appears to be a major factor in motorcycle vs. passenger car accidents. No only the motorcycle's relative size to the automobile, but the coloration of the clothing the riders wear affects an automobile driver's awareness of the motorcyclist.

SOURCES: CALIFORNIA HIGHWAY PATROL, MOTORCYCLE INDUSTRY COUNCIL, CALIFORNIA DEPARTMENT OF MOTOR VEHICLES.

DISTRIBUTED BY: LONG BEACH CHAPTER OF THE NATIONAL SAFETY COUNCIL FOR DEPARTMENT OF MOTOR VEHICLES TRAINING PROJECT.

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TYPES OF VEHICLES INVOLVED IN ACCIDENTS

In 1972, motorcycles, motor scooters, and motorized bicycles, which will be referred to simply as motorcycles in the rest of this report, comprised 3.1 per cent of the total vehicle registrations. These vehicles represented 1.2 per cent of the total number of vehicles in all motor-vehicle accidents. Therefore, based on their percentage of total vehicles registered, motorcycles have good experience in the all accident picture. However, these vehicles represented 4.0 per cent of all vehicles involved in fatal accidents. Deaths of operators and passengers of motorcycles totalled 2,700. The figures on the number of vehicles involved in accidents are shown in Table 1. Vehicle registration and occupant fatality figures are shown in Table 2.

Passenger cars have the opposite experience from that of two-wheeled motor vehicles. Passenger cars comprised 79.2 per cent of the registered vehicles in 1972. They represented 84.2 per cent of the vehicles involved in all motor-vehicle accidents and 75.3 per cent of those in fatal accidents. In summary, passenger cars were involved in more than their due share of total accidents based on vehicle registrations; motorcycles in less. Passenger cars were involved in less than their share of fatal accidents based on registrations; motorcycles in more.

Table 1

TYPES OF MOTOR VEHICLES INVOLVED IN ACCIDENTS, 1972

Type of Vehicle	In Fatal Accidents		In All Accidents		Per Cent of Total Vehicle Registrations*	No. of Occupant Fatalities
	Number	%	Number	%		
All Types	70,900	100.0%	29,100,000	100.0%	100.0%	##
Passenger cars	54,400	75.3	24,500,000	84.2	79.2	35,100
Trucks	12,700	17.9	3,500,000	12.0	17.1	5,500
Truck or truck tractor	8,000	11.3	2,830,000	9.7	16.3	**
Truck tractor and semi-trailer	3,700	5.2	440,000	1.5	0.8	**
Other truck combination	1,000	1.4	230,000	0.8		**
Farm tractors, equipment	200	0.3	22,000	0.1	/	180
Taxicabs	200	0.3	180,000	0.6	0.2	120
Buses, commerical	350	0.5	170,000	0.6	0.1	100
Buses, school	150	0.2	45,000	0.2	0.3	50
Motorcycles	2,600	3.7	320,000	1.1	3.1	2,500
Motor scooters, motor bikes	200	0.3	23,000	0.1		200
Other+	1,100	1.5	340,000	1.1	**	950

Source: Based on reports from 16 state traffic authorities. Vehicle registrations based on data from Federal Highway Administration and International Taxicab Association.

*Percentage figures are based on numbers of vehicles and do not reflect miles traveled or place of travel, both of which affect accident experience.

/These vehicles are not included in total vehicle registrations; estimated number--4,500,000.

+Includes fire equipment, ambulances, special vehicles, other. **Data not available.

##In addition to these occupant fatalities, there were 10,700 pedestrian, 1,100 pedalcyclist, and 100 other deaths.

Taken from Accident Facts, 1973 edition.

MOTORCYCLE RIDER DEATHS INCREASE

The number of motorcycles in the U. S. is continuing to rise sharply, as shown in the table below. Compared with a 59 per cent increase in all motor vehicles since 1961, motorcycle registrations increased 536 per cent.

Deaths of motorcycle riders increased 16 per cent in 1972 over 1971. This increase, the fourth in succession, followed two years of decreases in motorcycle rider deaths. The exact reason for this is not known, but it has been suggested by some authorities that varying enforcement of helmet laws and changes in the laws, and lack of helmet legislation in some states, has had an unfavorable effect.

The mileage death rate for motorcycle riders in 1972 is estimated at about 17 (deaths per 100,000,000 miles of motorcycle travel). Based on data collected by the Federal Highway Administration, the 1972 rate represents a decrease from the 1971 rate of 20. The motorcycle mileage death rate of 17 compares with the overall motor-vehicle death rate of 4.5 which includes pedestrian and non-occupant as well as occupant deaths.

Table 2

MOTORCYCLE* AND TOTAL MOTOR-VEHICLE DATA, 1960-1972

Year	Vehicles				Deaths			
	Motorcycles		Total Motor-Vehicles		Motorcycle Riders		All Mot. Veh. Occupants	
	No.	Yearly % Change	No.	Yearly % Change	No.	Yearly % Change	No.	Yearly % Change
1960 . . .	575,497		74,500,000		731		29,750	
1961 . . .	595,669	+ 3.5	76,400,000	+ 2.6	697	- 4.7	29,850	+ 0.3
1962 . . .	660,400	+10.9	79,700,000	+ 4.3	759	+ 8.9	32,300	+ 8.2
1963 . . .	786,318	+19.1	83,500,000	+ 4.8	882	+16.2	34,700	+ 7.4
1964 . . .	984,763	+25.2	87,300,000	+ 4.6	1,118	+26.8	37,900	+ 9.2
1965 . . .	1,381,956	+40.3	91,800,000	+ 5.2	1,515	+35.5	39,450	+ 4.1
1966 . . .	1,752,801	+26.8	95,900,000	+ 4.5	2,043	+34.9	42,800	+ 8.5
1967 . . .	1,953,022	+11.4	98,900,000	+ 3.1	1,971	- 3.5	42,700	- 0.2
1968 . . .	2,100,347	+ 7.6	103,100,000	+ 4.2	1,900	- 3.6	44,100	+ 3.3
1969 . . .	2,315,916	+10.3	107,700,000	+ 4.5	1,960	+ 3.2	45,200	+ 2.5
1970 . . .	2,814,730	+21.5	111,200,000	+ 3.2	2,330	+18.9	43,500	- 3.8
1971 . . .	3,345,179	+18.8	116,300,000	+ 4.6	2,410	+ 3.4	43,200	- 0.7
1972 . . .	3,787,000	+13.2	121,400,000	+ 4.4	2,700	+16.2	44,700	+ 3.5

Source: Vehicles--Federal Highway Administration; Motorcycle rider deaths, 1960-1967--National Center for Health Statistics; Motorcycle rider deaths, 1968-1972, and motor-vehicle occupant deaths--National Safety Council.

*Includes motor scooter, motorized bicycle, and motorized tricycle.

Taken from Accident Facts, 1973 edition.

SEVERITY OF MOTORCYCLE ACCIDENTS

When a motorcyclist is involved in an accident, his chances of being injured or killed are greater than if he were riding in a vehicle which afforded more protection. Nationally, for all types of vehicles, 8.5 per cent of the accidents involved death or injury. State studies have shown that the following percentage of all accidents involving motorcycles resulted in death or injury: Kentucky in 1969, about 88 per cent, 93 per cent in 1970; Kansas, 88.6 per cent in 1966 and 82.4 per cent in 1969; North Carolina, 90.3 per cent in 1966-1967.

Illinois data for the period of 1966 through 1970 revealed that motorcycles were involved in fatal and injury producting accidents 3 times more often than were passenger cars (passenger cars were involved in considerably more property damage accidents, proportionately, than motorcycles were, however).

Injuries sustained by motorcyclists involved in accidents tend to be more severe than those to people in accidents involving other types of vehicles, according to New York State studies. For example, the most severe type of injury was suffered by 23 per cent of those injured in motorcycle accidents, compared to 11 per cent of the persons injured in all vehicle accidents. New Jersey had similar experience with motorcyclists having serious injuries twice as often, percentage-wise, as occupants of all vehicles.

The actual number of motorcyclists injured annually is not known. However, for 1972, the total is indicated to have been somewhat more than 300,000, including both minor and severe injuries.

TYPES OF MOTORCYCLE ACCIDENTS

Collision with another motor vehicle is the predominant type of motorcycle accident. This type of accident as a percentage of all motorcycle accidents has ranged from 58 per cent in Kentucky to 82 per cent in Illinois.

In collisions with other vehicles, the motorcyclist is not always to blame. Many people have observed that drivers of larger vehicles do not always realize that motorcycles, especially motor scooters and motor bicycles, are also motor vehicles and should be treated as such. In most cases, automobile

drivers claim they did not see a motorcyclist in time to avoid an accident. The University of North Carolina Highway Safety Research Center reports that in collisions between motorcycles and automobiles, the automobile driver is more frequently guilty of a traffic violation. For example, Johnson reports that in motorcycle--other motor vehicle accidents, motorists were most often at fault when one vehicle cut off another.

Non-collision accidents are next in importance. The California Motorcycle Study showed no appreciable difference between the percentage of motorcycle accidents involving running off the road and the non-motorcycle experience for the same situation; relatively speaking, however, motorcycles overturned in the road much more often than did other vehicles. This latter point was noticed in other state reports also. Motorcycles are involved in few pedestrian accidents.

DIRECTIONAL ANALYSIS

The directional analysis of motorcycle-other vehicle collisions in New York revealed that 66 per cent of the accidents (133 of 200 studied) involved motorcycle collisions with passenger cars or trucks. Of the two-vehicle collisions, 66 per cent (87 accidents) were in right-angle collisions at intersections, parking lot entrances or driveways.

California reported that 58 per cent of the two-vehicle intersection accidents involving motorcycles were angle collisions. Motorcycles were involved in relatively fewer angle accidents and more opposite direction-one turn, one straight-accidents than non-motorcycles were. In two-vehicle non-intersection accidents, motorcycles were involved in a much higher proportion of accidents in which one vehicle was entering or leaving an alley, driveway, or similar way than non-motorcycles were; percentage-wise, motorcycles were involved in only half as many one-car parked or stopped accidents as non-motorcycles were.

CONTRIBUTING CIRCUMSTANCES

Due to different categories of possible contributing circumstances to motorcycle accidents, a complete comparison between the state reports is not feasible. In the total motorcycle accident experience, Wisconsin and Kentucky listed "speed too fast" as the principal circumstance. "Failure to yield right of way" was the most often reported circumstance in Michigan, Illinois, and Kansas. In fatal accidents, these same studies all listed "speed too fast" as the most frequent circumstance.

For drivers of all vehicles, failure to yield right of way was the chief type of improper driving in all accidents; in fatal accidents, it was speed too fast.

Speed. Although not specifically mentioned in all state reports, speed usually included speed too fast for conditions. Two states, Vermont and Washington, supplied information on the speed of the motorcycle at the time of the accident. In both studies the speed range most often recorded was 21 m.p.h. to 30 m.p.h. The Washington study indicated that standard size motorcycles tended to be involved in accidents at a somewhat higher speed than lightweight motorcycles were. California reported that 89 per cent of the motorcycle accidents in that state occurred at speeds of 40 m.p.h or under compared to about 77 per cent for other vehicles.

TIME AND DAY OF WEEK AND MONTH

Motorcycle accidents occur most frequently between 4 p.m. and 6 p.m., according to almost all state studies. These are also the hours during which all motor-vehicle accidents occur most often. Motorcycle accidents also frequently occur between 3:00 and 4:00 in the afternoon, and 6:00 and 7:00 in the evening.

The studies indicate Saturday to be the worst day of the week for motorcycle accidents. Again, this is also the worst day for all vehicle accidents. No general statement can be made regarding which day has the fewest accidents involving motorcycles since the studies vary, showing every week day except Friday for any one state.

It is no surprise that the summer months--June, July, and August--have the most motorcycle accidents as these are the months that motorcycles are most used.

ROADS AND WEATHER

The majority of motorcycle accidents (84 to 96 per cent) occur on dry roads. This might be expected since motorcycles are not driven much on wet or icy roads. New York showed that most of the motorcycle accidents in that state occurred on level roads with no traffic control devices present. Accidents happened with equal frequency at intersections and between intersections.

California also showed a majority of motorcycle accidents occurred on straight, level roads, however the percentage of such accidents was somewhat less than that shown for non-motorcycles. California likewise listed no traffic controls present in the majority of motorcycle accidents.

Defective road conditions, such as holes or loose materials on the road surface, were reported in about 5½ per cent of the motorcycle accidents compared to 1½ per cent of non-motorcycle accidents in California. There are some indications from a few other states that California's experience is not unusual.

A majority of the accidents take place during daylight hours.

AGE, SEX, RESIDENCE OF OPERATOR

All studies, except New York's, show that a majority of motorcycle operators involved in accidents are young--under 25 years of age. Most of the other studies show from 42 to 66 per cent of the motorcyclists in accidents are under 20 years of age.

In excess of 90 per cent of the motorcycle operators were males. However, limited information indicates that about 15 to 20 per cent of the people killed or injured were female. This would indicate, then, many of the females injured were passengers on the machines.

The Vermont study reported that the motorcycle operator was within five miles of his residence when involved in an accident in 64 per cent of the cases; within 15 miles in 79 per cent. Other state studies indicate motorcyclists to be local residents in more than three-fourths of the accidents.

PASSENGERS

Limited information is available on whether the person injured was an operator or passenger. "Passengers appear to figure more heavily in single vehicle accidents than in multivehicle accidents," according to the University of North Carolina Highway Safety Research Center. The study also indicated the presence of passengers in 60 per cent of the accidents associated with blowouts (possibly due to the additional weight).

EXPERIENCE OF OPERATOR

Limited information is available on the cycling experience of motorcyclists involved in accidents. It can be surmised, however, that most motorcyclists involved in accidents have not had much riding experience since cycling has increased greatly in recent years and the average age of motorcyclists is young. A survey of 123 patients at the Methodist Hospital in St. Louis Park, Minnesota, and at the Hennepin County General Hospital, Minneapolis, revealed that 20 per cent were using the motorcycle for only the first or second time. The Vermont study reported 21 per cent of the operators had driver's licenses for less than one year. California's motorcycle report showed that four times as many motorcycle accidents than non-motorcycle accidents involved drivers with less than one year's driving experience.

The Minnesota hospital study mentioned above reported that 70 per cent of the injured had either rented or borrowed the motorcycle. A study by the Minneapolis Police Department showed similar results. The Washington State study of 1965-1966 showed that 29 per cent of the cyclists involved in fatal accidents did not own the motorcycle which they were riding. While there was a rather wide variation in the percentage of motorcycles which were borrowed in accidents, these and a couple of other studies indicate that the figure is well in excess of 20 per cent. This would imply that many motorcycle accident victims were not regular motorcycle operators or passengers and/or had mishaps early in their cycling experience.

Borrowers of motorcycles were involved in about 23 per cent of the reported motorcycle accidents in North Carolina while they drove approximately two per cent of the total annual motorcycle mileage, according to the University of North Carolina Highway Safety Research Center.

Training in the proper operation of a motorcycle is an important aspect directly or indirectly involved in most of the above paragraphs. A study of motorcycle accident victims in the Charlottesville, Virginia area showed that 72 per cent of the operators had received no instruction in operating motorcycles. One of the three cited major contributing factors in injury-producing accidents involving students at the University of North Carolina, Chapel Hill was "lack of knowledge of the operation of the vehicle on the part of the owners and borrowers, relating particularly to turning, stopping, and riding properly in traffic," according to the specially-conducted research report on injuries arising from motorcycle accidents. The Johnson study claims motorcyclists' inexperience and inappropriate use of their vehicle controls while riding figured highly as factors contributing to motorcycle accidents.

The authors of "The California Motorcycle Study" cogently state the following in their Conclusion, "In the present writers' estimation, the most important finding of this study concerns the role of age and experience in motorcycle accidents and traffic convictions. Both the regression and chi-square analyses suggest that lack of skill or inexperience are more important factors in motorcycle accidents than in non-motorcycle accidents. Since level of skill is a partial function of vehicle familiarity, training, and licensing, more effort in these areas is indicated...the data indicates that a person who can drive a car safely may not always be able to drive a motorcycle safely. Consequently, serious consideration should be given toward insuring that persons not be authorized to drive motorcycles unless they possess the requisite skill."

PART OF BODY INJURED

All studies show that the parts of a motorcyclist's body most often injured are the head, arm, and leg. Internal injuries and multiple injuries also commonly occur however. The most serious type injury is that occurring to the head. An Illinois study revealed that two-thirds of the motorcyclists killed in that state suffered skull fractures. This type of injury predominated over any other type. Similarly, almost two-thirds of the motorcyclists killed in Washington State died from injuries to the head or skull. A report of the Office of the Chief Medical Examiner-Coroner of Los Angeles County, California stated, "Motorcycle accident fatalities are characterized by a high proportion of head injuries."

MAKE AND WEIGHT OF MOTORCYCLE

A statement regarding the accident experience and relative safety of different brands of motorcycles cannot be made at this time. Little information is available on this subject and the information is inconclusive.

An Oregon study commented on the relationship between motorcycle weight and accident severity. The report stated, "there was a tendency for higher per cents of personal injury accidents as the weights of the vehicles decreased."

Available statistics indicate that operators of lightweight motorcycles, motor scooters, and motorized bicycles are somewhat younger than operators of standard motorcycles. There is also reason to believe these operators have less driving experience than operators of the larger machines.

MOTOR SCOOTER ACCIDENTS

A National Safety Council study of 1958 fatal motor scooter accidents showed that 35 per cent of the victims were under 16 years of age although not all were drivers. Sixty per cent of the victims were under 21 years of age. The motor scooter study revealed other facts similar to those presented in this report.

MOTORCYCLE LEGISLATION

The high likelihood of death or injury to a motorcycle rider who is involved in an accident has prompted many states to take action to protect the cyclist. Nearly all states require motorcycle riders to wear safety helmets. More than half the states require a special license for motorcycle operation, periodic motorcycle safety inspection, and eye protection. One-fifth of the states require the use of headlight at all times.

SAFE MOTORCYCLE OPERATION

Several basic points of safe motorcycle operation are clear.

1. Because drivers of other motor vehicles are often guilty of precipitating accidents through their failure to see a motorcyclist, good motorcycle riders should always imagine themselves to be "invisible" to other members of the traffic mileau. A rider who constantly thinks of himself and his machine as being "invisible" will never put himself into a position where his safety is dependent on the driving performance of another motorist. He will also understand the necessity to take steps to make himself more visible, such as riding with his headlight on at all times, wearing brightly-colored--reflective clothing, and riding in the left wheel track areas of the traffic lane. The recognition of his own invisibility and the habit of constant alertness is especially important to the motorcyclist at intersections, driveways, and alleyways--where many car-motorcycle accidents occur.

2. The cyclist should maintain a speed safe for his driving conditions and also within his own capabilities. Proper adjustment to driving conditions--especially weather and road conditions--is of special importance since the motorcycle's design makes it extremely vulnerable to slippery or rough surfaces. This vulnerability is evidenced by the large proportion of single-vehicle collisions involving motorcycles.

3. Before a cyclist can effectively adapt to adverse riding conditions, he must be familiar with his machine, know proper riding techniques, and be able to respond to various hazards with a high level of skill. For example, the motorcyclist should know how to brake safely on both dry and wet surfaces, applying the rear brake slightly ahead of the front brake and applying the front brake more heavily when the pavement is dry. However, he should be aware of the danger of skidding caused by locking the front wheel on a slippery or rough road surface.

4. The rider should recognize the value of protective apparel.

Protective headgear is effective in reducing motorcycle fatalities. For example, motorcycle fatalities dropped 49 per cent in Washington State following the requirement that motorcycle riders wear protective helmets. The number of motorcycle riders suffering fatal head injuries was reduced 61 per cent. In Michigan, deaths of motorcycle riders showed a continual increase from 1964 through 1968 with the exception of 1967, the year Michigan had a helmet law in effect.

A U. S. Department of Transportation study showed that for the years 1967-1970, that states with helmet laws had a consistently lower fatal accident rate (the number of fatal accidents per 10,000 registered motorcycles) than did states without a helmet law. The average difference was 1.4 fatal accidents (per 10,000 motorcycles) less for the helmet-law states. It is felt that the difference could well have been greater if all states with helmet laws had equally enforced such statutes.

The British have done a number of studies on protective headgear. Without exception they have found that safety helmets have considerably reduced the risk of injury to the covered parts of the head, lessened the severity of injury when it did occur, and, of course, also markedly reduced the incidence of death.

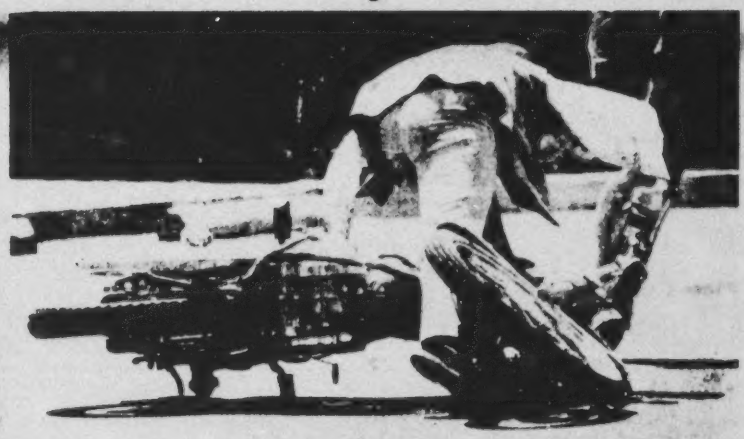
Protective headgear can further identify the wearer as a motorcyclist. The distinctive color and shape of the protective headgear may draw greater attention to the presence of the cyclist by other road users.

Other protective apparel such as face shields and eye protection, including bubbles and flat shields, goggles, safety sunglasses, and windshields, can prevent injury and possible loss of control resulting from being struck by airborne objects. Motorcyclists should also wear boots, gloves, sturdy jackets and pants (preferably leather) to protect against abrasions in case of a spill; for example, an equestrian would not mount a horse dressed in shorts and sandals. An improperly dressed motorcyclist is increasing his chances of serious injury.

DDC MOTORCYCLE SUPPLEMENT

In addition to these safety pointers, many others are covered in detail in the National Safety Council's DDC Motorcycle Supplement. The Motorcycle Supplement is a two-hour course making use of lectures, discussions, slide presentations, and outside readings. The course covers such topics as knowing: your bike, how to check out a used bike, physical laws and fundamentals of riding, how to adapt to hazardous light, weather, road, traffic, vehicle and driver conditions, group riding, vehicle maintenance, how to carry passengers and parcels, how to park and prevent motorcycle theft. Precautions on when to lend your motorcycle to someone else are included.

The course is designed both to teach the beginning rider the basic principles of safe motorcycle operation, to provide the experienced rider with a comprehensive review of motorcycle safety. The course is available from selected state and local safety councils and other cooperating agencies which offer the National Safety Council's Defensive Driving Course. Contact your local safety council, or the National Safety Council, for details.



The four photos on this page show what happened during one examiner's first attempt to ride a motorcycle. (Photos - Courtesy of Sacramento Union)

APPENDIX B

STATE OF CALIFORNIA

DEPARTMENT OF MOTOR VEHICLES

DIVISION OF FIELD OFFICE OPERATION

SPECIFICATIONS FOR 7 INCH FLUORESCENT PLASTIC TRAFFIC CONES

I SCOPE

This specification covers 7" plastic traffic cones used to provide fluorescent daytime delineation.

II DESCRIPTION

A. Materials: The conical section of the traffic cones shall be composed of a polyvinyl chloride compound; and shall be fabricated of an inner and outer layer fused into one piece. The base shall be composed of high density weighted polyvinyl chloride or molded rubber with specific gravity not less than 1.5.

B. Color: The outer layer of the conical section shall be (within reasonable limits) a bright fluorescent red-orange.

C. Dimensions:
1. Height (approximate) 7"
2. Weight (approximate) 1½ lbs.
3. Base (approximate) 8" x 8"

III IDENTIFICATION

"CALIF. DMV" shall be placed vertically on one side of the conical section of the 7 inch cones in one-half (½) inch letters. The method of application shall produce neat, easily read, permanent lettering that cannot be removed without damaging the cone.

STATE OF CALIFORNIA

DEPARTMENT OF MOTOR VEHICLES

DIVISION OF FIELD OFFICE OPERATION

SPECIFICATIONS

FOR

WHITE TRAFFIC LINE PAINT

I. GENERAL PROVISIONS

All ready-mixed paints must be of a consistency suitable for use on pavements and curbings either asphaltic or Portland cement type.

II. APPLICABLE SPECIFICATIONS

A. Federal Specifications; latest revision.

B. Federal Test Method Standard No. 141; latest revision.

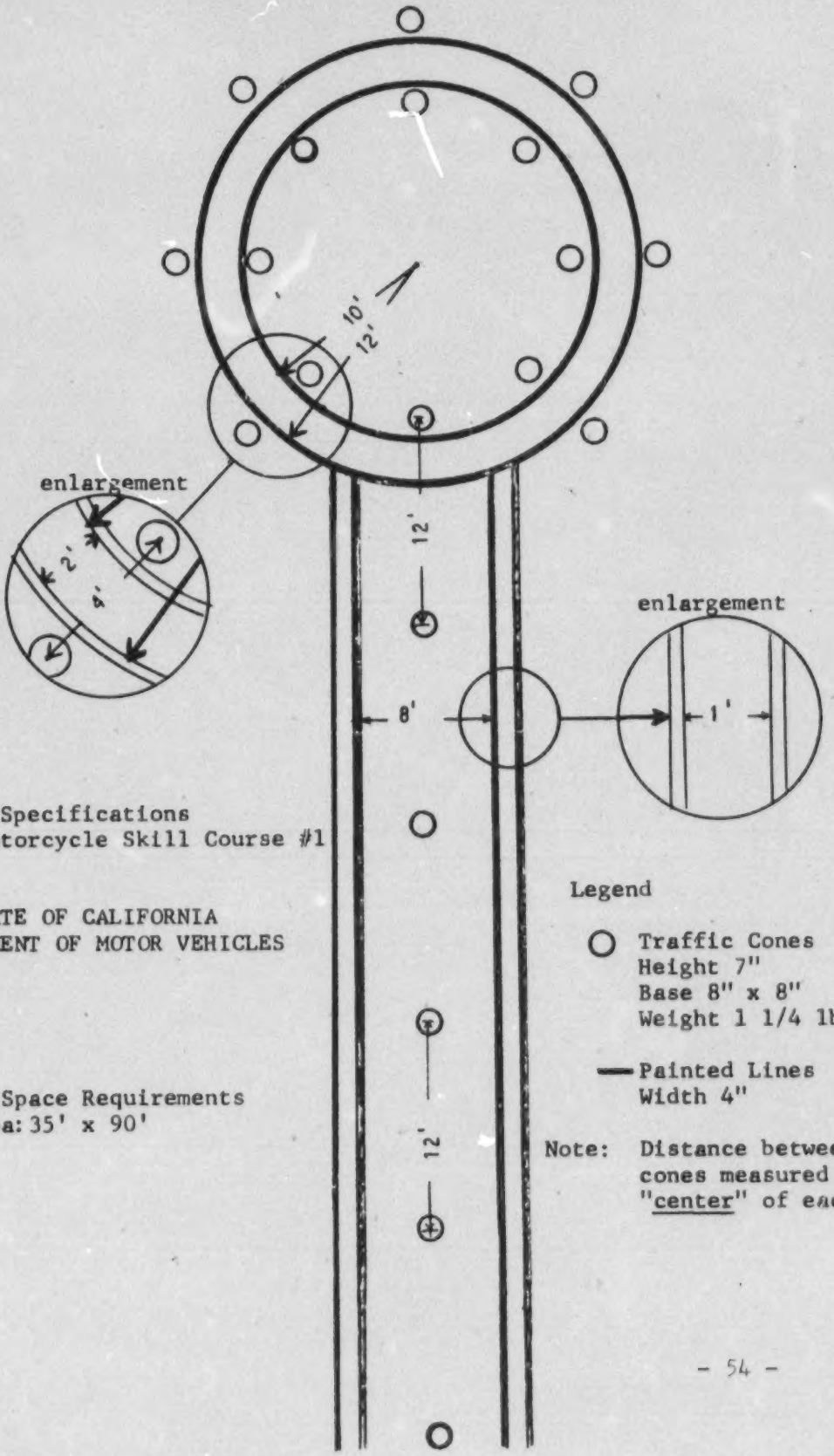
C. California State Specifications No. 731-80-95.

III. PACKAGING

The paint shall be furnished in 1 gallon containers.

All shipping containers must comply with the Department of Transportation Code of Federal Regulations, Hazardous Materials Regulations Board, reference 49CFR.

All containers of paint shall be labeled showing the exact title of the specification, state specification number, manufacturer's name, date of manufacture, state lot number and manufacturer's batch number.



Specifications
Motorcycle Skill Course #1

STATE OF CALIFORNIA
DEPARTMENT OF MOTOR VEHICLES

Overall Space Requirements
Area: 35' x 90'

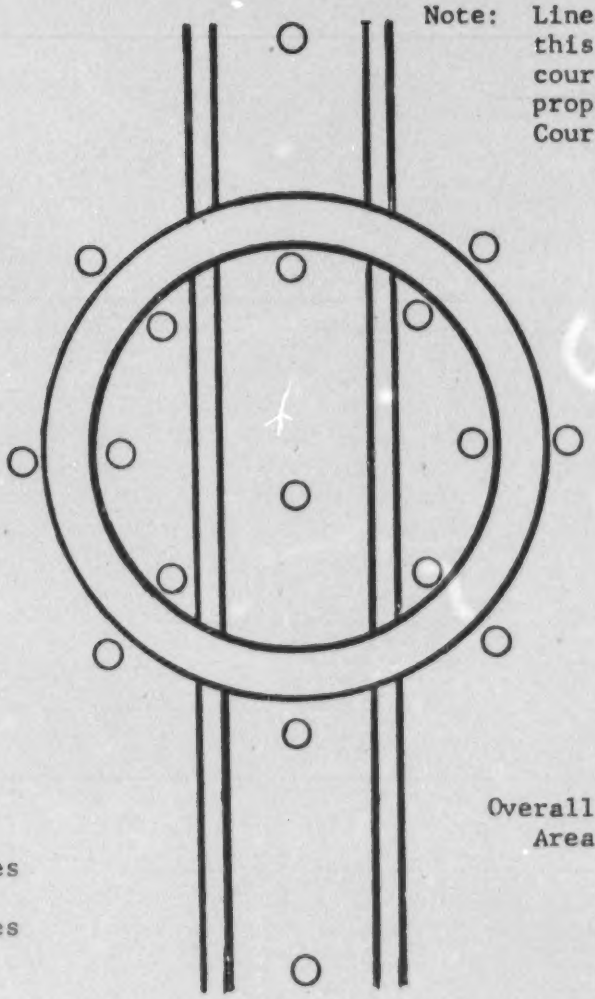
Legend

○ Traffic Cones
Height 7"
Base 8" x 8"
Weight 1 1/4 lb.

— Painted Lines
Width 4"

Note: Distance between traffic cones measured from "center" of each cone.

Specifications
ALTERNATE
Motorcycle Skill Course #2



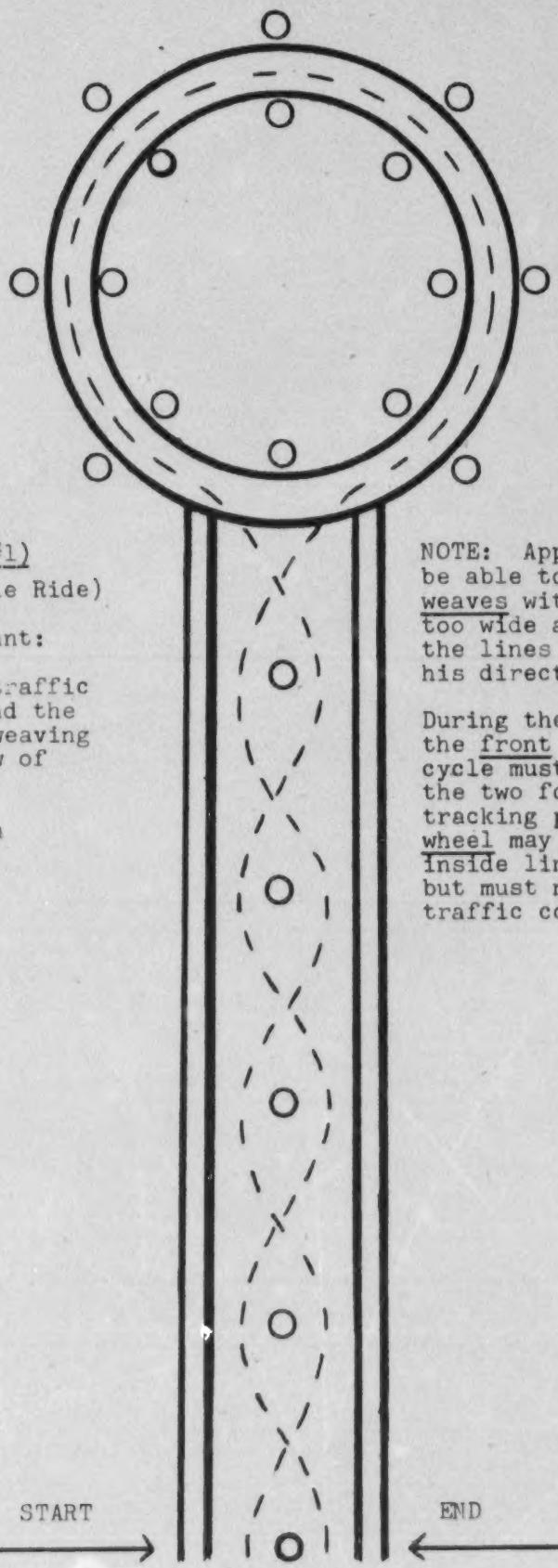
Note: Linear measurements for this alternate skill course are exactly proportionate to Skill Course #1

Legend

○ Traffic Cones

— Painted Lines

Overall Space Requirements
Area: 35' x 70'



Administering the
Skill Test (Step #1)

(Serpentine Ride & Circle Ride)

Instructions to Applicant:

"Weave through row of traffic cones; ride once around the circle and return by weaving once again through row of traffic cones."

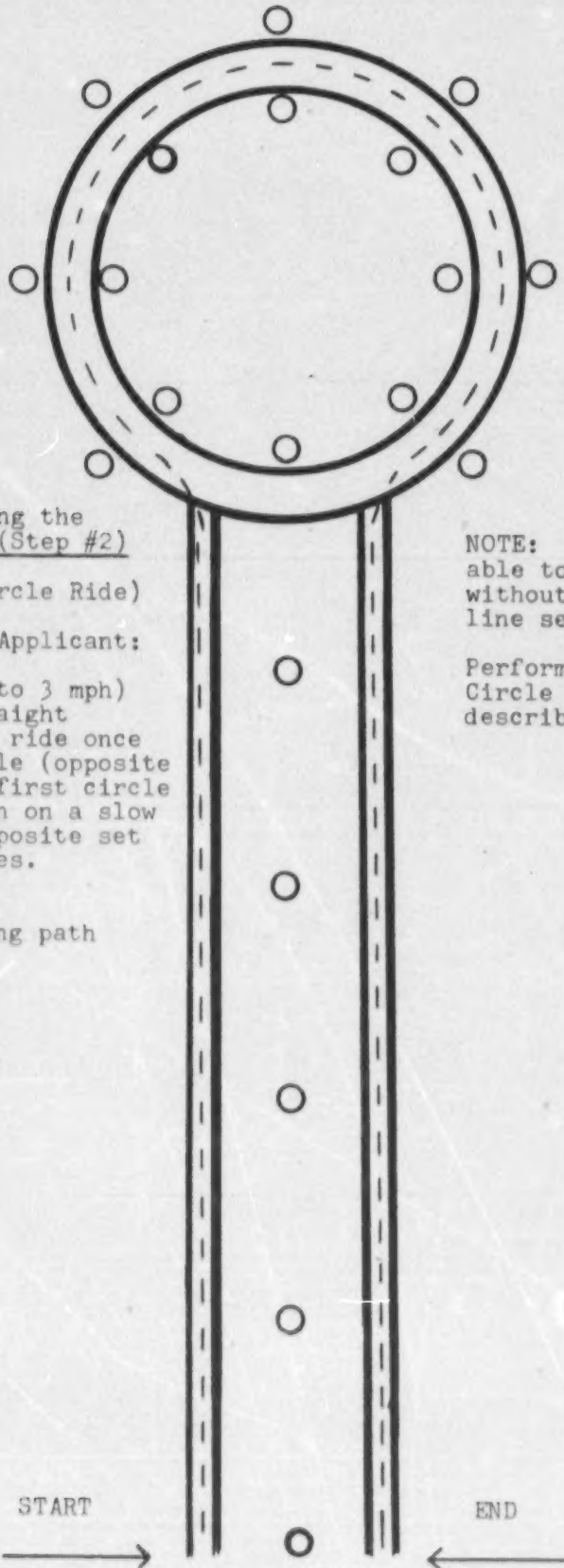
- - - M/C tracking path

NOTE: Applicant should be able to execute cone weaves without swinging too wide and cross over the lines parallel to his direction of travel.

During the Circle Ride, the front wheel of the cycle must stay within the two foot wide tracking path. The rear wheel may cross over the inside line of the circle but must not strike the traffic cones.

START

END



Administering the
Skill Test (Step #2)

(Slow Ride and Circle Ride)

Instructions to Applicant:

"Ride slowly (2 to 3 mph) between the straight parallel lines; ride once around the circle (opposite direction from first circle ride) and return on a slow ride between opposite set of parallel lines.

- - - M/C tracking path

NOTE: Applicant should be able to execute slow ride without crossing over either line set one foot apart.

Performance standard during Circle Ride is the same as described in Step #1.

APPENDIX C

CALIFORNIA DEPARTMENT OF MOTOR VEHICLES

MOTORCYCLE TRAINING PROJECT

BREAKDOWN OF TRAINING SCHEDULE

1974

Number of Participants Trained by Location

Date	Long Beach City College	San Diego	San Bernardino	Bakers-Field	Oakland	Sacra-mento	Redding	Total Number Sessions	Total Number Partici-pants
Mar 30	40							1	40
Apr 6	39	25						2	64
Apr 20	42	26						2	68
Apr 27	38		30					2	68
May 4	36		35					2	71
May 11	33			40				2	73
May 18	37				40			2	77
May 25					41			1	41
Jun 1					42	47		2	89
Jun 8					37	42		2	79
Jun 15							32	1	32
						Grand Total Sessions (11 Saturdays)		19	
						Grand Total Participants			702

Number trained participants by job title

100 - Manager I

143 - Motor Vehicle Representative

459 - Drivers License Examiner

702 Total

67

68

STATE OF CALIFORNIA
DEPARTMENT OF MOTOR VEHICLES
MOTORCYCLE TRAINING PROJECT

MAP OF TRAINING LOCATIONS

NORTHERN CALIFORNIA

Redding DMV
2135 Akard Avenue

Sacramento DMV
2415 First Avenue

Oakland DMV
5300 Claremont Avenue

SOUTHERN CALIFORNIA

Bakersfield DMV
3120 "F" Street

San Bernardino DMV
1310 North Waterman Avenue

Long Beach City College (BTC)
1301 East Pacific Coast Highway

San Diego DMV
3960 Normal Street

APPENDIX D

Motorcycle Skill Tests Administered During Base Year 1 May 73 thru 30 Apr 74

District 1	
42	Alturas
104	Crescent City
323	Eureka
41	Fall River Mills
36	Garberville
55	Mount Shasta
149	Red Bluff
570	Redding
29	Tulelake
60	Weaverville
84	Yreka
1,493	

District 2	
307	Auburn
608	Chico
78	Colusa
233	Grass Valley
77	Orland
354	Oroville
63	Quincy
910	Roseville
103	Susanville
114	Truckee
50	Willows
828	Yuba City
3,725	

District 3	
2428	Carmichael
836	Fairfield
168	Jackson
539	Lodi
254	Placerville
1709	Sacramento
76	San Andreas
232	Sonora
177	South Lake Tahoe
915	Stockton
568	Vallejo
388	Woodland
8,290	

District 4	
104	Coalinga
1878	Fresno
94	Los Banos
208	Madera
330	Manteca
43	Mariposa
734	Merced
1183	Modesto
411	Reedley
159	Tracy
360	Turlock
5,504	

District 5	
168	Arvin
1623	Bakersfield
139	Bishop
128	Delano
967	Hanford
470	Porterville
458	Ridgecrest
165	Shafter
301	Taft
220	Tulare
474	Visalia
5,113	

District 6	
1284	Corte Madera
1200	Daly City
103	Fort Bragg
250	Lakeport
438	Napa
583	Petaluma
1067	Redwood City
1448	San Francisco
1076	San Mateo
983	Santa Rosa
245	Ukiah
8,677	

District 7	
1012	Alameda
1110	El Cerrito
1521	Fremont
1888	Hayward
646	Livermore
376	Martinez
1092	Oakland
684	Oakland-Coliseum
654	Pittsburg
1137	Walnut Creek
10,120	

District 8	
190	Gilroy
72	Hollister
68	King City
1435	Los Gatos
2171	Mountain View
618	Salinas
1756	San Jose
1777	Santa Clara
710	Santa Cruz
901	Seaside
214	Watsonville
9,912	

District 9	
1106	Lancaster
691	Lompoc
580	Newhall
909	Oxnard
188	Paso Robles
1376	San Fernando
745	San Luis Obispo
1345	Santa Barbara
458	Santa Maria
247	Santa Paula
1296	Thousand Oaks
2336	Van Nuys
772	Ventura
2487	Winnetka
14,536	

District 10	
1186	Culver City
2085	Glendale
1208	Hollywood
1144	Santa Monica
5,623	

District 11	
674	Compton
2037	Hawthorne
979	Inglewood
2198	Long Beach
724	San Pedro
1923	Torrance
8,535	

District 12	
297	Barstow
712	Fontana
40	Needles
2693	Pasadena
1673	Pomona
690	Redlands
1125	San Bernardino
407	Twentynine Palms
1602	Upland
514	Victorville
3051	West Covina
12,804	

District 13	
3326	Anaheim
2977	Bellflower
1165	Bell Gardens
1888	Costa Mesa
547	Hemet
1690	Riverside
761	San Clemente

Motorcycle Skill Tests Administered (Continued)

District 13(Cont'd)	
2944	Santa Ana
3295	Westminster
2558	Whittier
21,151	

District 14	
149	Banning
129	Blythe
145	Brawley
2671	Chula Vista
281	El Centro
1319	Escondido
345	Indio
2968	La Mesa
1438	Oceanside
306	Palm Springs
4257	San Diego
14,008	

Grade 5	
481	Los Angeles
1425	Montebello
1,906	

TRAVEL CREW SERVICE

District 1	
113	Arcata
11	Ferndale
25	Fortuna
12	Hoopa
16	Scotia
0	Willow Creek
8	Burney
6	Dorris
19	Hayfork
6	Happy Camp
216	

District 2	
1	Corning
4	Paradise
18	Chester
5	Downieville
12	Greenville
14	Herlong
5	Loyalton
13	Portola
72	

District 3	
162	Davis
13	Dixon
72	Folsom
25	Rio Vista
14	Bridgeport
0	Markleeville
286	

District 4	
14	Firebaugh
29	Sanger
33	Selma
47	Oakhurst
15	Chowchilla
33	Dos Palos
36	Newman
104	Oakdale
42	Patterson
353	

District 5	
30	Corcoran
0	Death Valley
42	Kernville
10	Lone Pine
3	Shoshone
1	Furnace Creek
86	

District 6	
7	Half Moon Bay
19	Calistoga
23	Cloverdale
41	Healdsburg
19	Saint Helena
70	Sonoma
4	Boonville
13	Covelo
17	Point Arena
44	Willits
257	

District 9	
34	Mojave
0	Men's Colony
5	Pismo Beach
13	Solvang
52	

District 12	
22	Avalon
34	Big Bear
56	

District 13	
262	Corona
262	

District 14	
17	Winterhaven
17	

Total Field Office - 131,397

Total Travel Crew Service - 1,657

GRAND TOTAL - DIVISION 133,054

APPENDIX E

MOTORCYCLE TRAINING PROJECT

PRE-TEST

		Response Distribution
1.	To activate the brake light on most motorcycles, the operator must apply:	
*	a. the rear brake	540
	b. the front brake	45
	c. the front and rear brakes simultaneously	86
	d. the brake light switch	31
2.	In normal city riding, a motorcycle rider should approach which of the following as close to right angles as possible:	
	a. railroad tracks	456
	b. painted crosswalk lines	21
	c. manhole covers	7
*	d. all of the above	218
3.	When a motorcycle rider leans the cycle as little as possible, he would most likely be:	
	a. turning to the left	24
*	b. riding on a slippery road	625
	c. turning to the right	25
	d. making a "U" turn	28
4.	By leaning in the direction of a high speed turn, a motorcycle rider will:	
*	a. minimize the force of inertia	590
	b. extend his leg to the inside of the turn	40
	c. decrease his control in the turn	62
	d. make stopping easier	10
5.	On a multiple lane highway when all lanes are occupied by vehicles stopped ahead of you it is best to:	
	a. pass on the right	9
	b. pass on the left	44
*	c. remain in the line behind one lane of vehicles	604
	d. ride on the painted line between cars	45
6.	Testing an applicant's ability to maintain balance on a motorcycle is best accomplished at speeds of:	
	a. 4 to 5 MPH	214
	b. 6 to 10 MPH	166
	c. over 25 MPH	20
*	d. 2 to 3 MPH	302
7.	Down shifting of the gears is recommended when the motorcycle is:	
	a. stopping under normal conditions	118
	b. starting up a steep hill	28
	c. riding into sand, gravel, or mud	58
*	d. all of the above	498

* Indicates correct answer

		Response Distribution
8.	When making a normal stop, the motorcyclist should:	
	a. apply both the front and rear brakes at the same time	264
	b. apply the front brake first because it has better stoping power	61
*	c. apply the rear brake slightly before the front	344
	d. extend both legs out from the motorcycle to provide balance when stop is complete	33
9.	Generally, a novice motorcyclist will have the most difficulty in negotiating a tight circle:	
	a. to the left	181
*	b. to the right	274
	c. both left and right	242
	d. none of the above	5
10.	If brakes are applied in a turn, to help avoid the tendency to skid, you should:	
	a. Use the front brake because of greater stopping power	72
	b. apply hard pressure on the rear brake only	41
	c. turn away from the direction of the skid	84
*	d. None of the above is correct	505
11.	The proper following distance on a motorcycle should be:	
	a. keep one motorcycle length for every 10 mph	201
*	b. use the two second rule	113
	c. space cushion only needed above 50 mph	8
	d. none of the above is correct	380
12.	California law requires that every motorcycle be equipped with:	
	a. windshield	10
*	b. rear view mirror	583
	c. spark arrester	100
	d. crash bars	9
13.	On a motorcycle:	
	a. the foot brake pedal activates the front wheel brake	37
*	b. the foot brake pedal activates the rear wheel brake only	583
	c. both the front and rear brake is operated by the same pedal	24
	d. the hand brake lever controls both brakes	58
14.	Tires designed for off-road use are considered safe for highway use because of:	
	a. better traction for braking	68
	b. better traction in turns	87
	c. more surface contact with the road	118
*	d. none of the above	429
15.	Statistics show that most motorcycle accidents occur:	
	a. on freeways	16
	b. in the middle of the block	29
	c. with vehicles backing out of driveways	25
*	d. at intersections	632

* Indicates correct answer

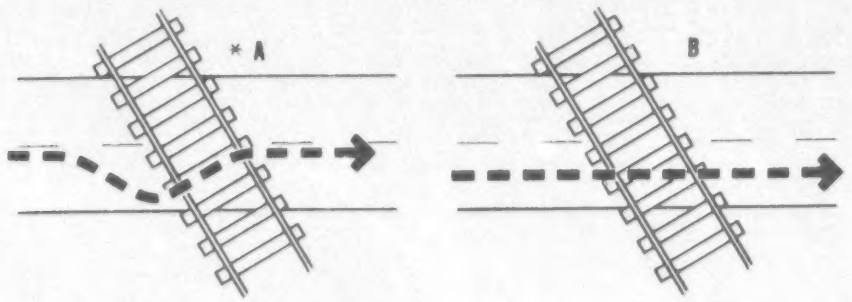
MOTORCYCLE TRAINING PROJECT

POST-TEST

	Response Distribution
1. When approaching from behind two lanes of vehicles stopped at a traffic signal, you should:	
* a. stop behind the last car in either lane	667
b. pass on the right	6
c. pass on the left	15
d. pass between the two lanes of cars	14
2. California law requires that every motorcycle be equipped with:	
a. crash bars	2
b. windshield	25
* c. muffler	646
d. spark arrester	29
3. When stopping under normal conditions, you should:	
* a. apply both front and rear brakes, the rear brake slightly before the front	625
b. apply rear brake only	14
c. apply front brake only	21
d. change to lower gear and use rear brake only	42
4. If brakes are applied in a turn, the tendency to skid will be:	
* a. increased	555
b. decreased	29
c. increased on wet surfaces only	109
d. not affected	9
5. On a motorcycle:	
a. the rear wheel brake has the greater stopping power	22
* b. the front wheel brake has the greater stopping power	674
c. both brakes have equal stopping power	6
d. none of the above is correct	0
6. For most beginning motorcycle riders, negotiating a tight circle to the left is more difficult than to the right:	
a. true	70
* b. false	632
7. Proper following distances are more important for motorcycles than for autos because:	
a. motorcycles cannot stop as quickly	47
b. vision is more restricted	53
* c. in a sudden stop, it is possible to overbrake and lose control	597
d. less attention is required to operate a motorcycle	5
8. Off-the-road tires are less safe than road tires when a machine is being used on the highway because:	
a. the area of tread on the road surface is less	154
b. traction for turns is less	21
c. traction for braking is less	28
* d. all of the above	499

* Indicates correct answer

		Response Distribution
9.	As you are slowing down for a stop, you should:	
	a. shift to neutral	32
*	b. shift to lower gears	590
	c. shift to higher gears	37
	d. put your foot down	43
10.	Often, a beginning motorcycle rider will experience more difficulty in balancing his cycle at slower speeds rather than higher speeds.	
*	a. true	681
	b. false	21
11.	A skillful rider in making a high-speed turn will:	
	a. keep his body erect	26
*	b. lean in the direction of the turn	653
	c. lean opposite to the turn	19
	d. extend his leg to the inside of the turn	4
12.	When riding on slippery roads you should:	
	a. lean the cycle as little as possible	44
	b. use the front brake carefully	5
	c. slow down	49
*	d. all of the above	604
13.	On nearly all makes and models of motorcycles, the brake light is activated by applying either the front or rear brake.	
	a. true	346
*	b. false	356
14.	Which of the following diagrams shows the safest way to cross railroad tracks:	



a. - 569
b. - 133

15.	Most motorcycle accidents happen:	
	a. at the middle of the block	9
	b. on freeways	4
	c. at driveways	8
*	d. at intersections	681

* Indicates correct answer

DEPARTMENT OF MOTOR VEHICLES
MOTORCYCLE TRAINING PROJECT
PARTICIPANT EVALUATION OF TRAINING

Name _____ Job Title _____ Date _____

1. How do you rate the three hours of motorcycle training you received during the classroom phase?

	Response Distribution
A ( ) Excellent	491
B ( ) Good	196
C ( ) Fair	13
D ( ) Poor	2
E ( ) Unsatisfactory	0

2. How do you rate the three hours of motorcycle training you received during the practical (hands-on) phase?

	Response Distribution
A ( ) Excellent	414
B ( ) Good	245
C ( ) Fair	43
D ( ) Poor	0
E ( ) Unsatisfactory	0

3. How do you rate the motorcyle training you received on the following items? (Please check only ONE answer for EACH item.)

	Excellent (A)	Good (B)	Fair (C)	Poor (D)
	Response Distribution			
a. Identification and use of the controls	596	101	5	0
b. Proper procedure for starting the engine	608	89	5	0

		Excellent (A)	Good (B)	Fair (C)	Poor (D)
c.	Proper use of throttle and clutch	525	157	20	0
d.	Proper use of the brakes	530	150	20	2
e.	Proper skilled maneuvers	399	254	48	1
f.	Improper and unskilled maneuvers	337	284	78	3
g.	Hazardous riding situations	333	265	97	7
h.	Emergency riding situations	310	276	103	13
i.	Defensive riding techniques (techniques peculiar to motorcycle riding)	410	236	53	3
j.	Importance of protective apparel	450	113	76	63

4. To what degree do you feel the training you received will help you in conducting motorcycle skill tests?

		Response Distribution
A	( ) It is of great help	532
B	( ) It is of some help	162
C	( ) It is of little help	6
D	( ) Not sure I received any help	2

5. Comments:

A few selected comments as written by the participants are shown on pages 29 and 30 of this report.

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